

ANTECEDENTS OF ONLINE LEARNING EFFECTIVENESS AND ITS IMPACT ON EDUCATIONAL ETHICS: A COMPARATIVE STUDY BETWEEN INDIA AND MALAYSIA

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ABSTRACT

COVID-19 pandemic has forced the implementation of a new normal for all businesses leading to an increase in stress levels for many including educators and students. Ethics in education was questioned by professional bodies due to online exams. The objective of this study is to determine the antecedents of student online learning effectiveness and its impact on educational ethics. The study compares Malaysia and India since some Indian educational institutions had been implementing online teaching prior to the pandemic. Data was collected through a survey method. 571 questionnaires from students across Malaysia and India were analyzed using SPSS and PLS-SEM. It was found that physical, psychological, intellectual, and emotional attributes were significant in predicting learning effectiveness which in turn had an impact on educational ethics. Intellectual attributes were the most important predictor of learning effectiveness. The emotional and psychological attributes had a small impact on learning effectiveness. Furthermore, physical attributes had trivial effects on the learning effectiveness. A T-test comparing mean differences between the two countries revealed that there were no significant differences in learning effectiveness between students of both countries while educational ethics was more evident among Indian students as compared to Malaysian students. The key implication is the need for educational institutions and educators to develop pedagogies to stimulate students' intellectual abilities during online teaching to preserve educational ethics. HEIs must support the students psychologically, emotionally and encourage themselves to keep physically active during the phase of online classes. Institutions must take ample steps to ensure that educational ethics is not affected as a result of the new normal failing which could prove detrimental in the long run for students and institutions. This will help to curb unethical practices during online examinations and mitigate academic dishonesty. Our findings regarding various attributes of online learning effectiveness add profoundly to literature and help to understand antecedents contributing to successful learning effectiveness which leads to positive educational ethics in both the countries.

Keywords: *online learning effectiveness; educational effectiveness, India, Malaysia*

INTRODUCTION

Online education has grown significantly due to advances in technology and access to it, offering students various options and methodologies to further their education and achieve career growth. E-learning has increased in popularity in higher education because it offers traditional education along with professional development, and moreover, flexibility and accessibility are the main advantages (Pribilová & Beňo, 2024). Educators can control changing educational needs through digitization while creating a niche in pedagogy through advanced technologies (Barakat et al., 2023; Sánchez et al., 2021), which triggers enthusiasm in young learners (Adeniyi et al., 2024; Aderibigbe, 2021). Despite advances and refinements in technology, teaching, and learning in higher education continue to follow the conventional face-to-face system, and technology in any form is treated only as a supplement to improve the student learning experience and not to transform the education process itself, which is more pertinent in emerging economies (Masa'deha et al., 2022; Nasiatin et al., 2023).

It is important to note that the recent COVID-19 pandemic has enforced a 'new norm', curbed physical interaction, and imposed various restrictions (Tibbetts et al., 2021; Kapasia et al., 2020). Education institutions worldwide were shut down and this hugely affected students' core learning activities (Kumar et al., 2020) such as lab work, and access to libraries and databases/search engines, many of which deeply compromised students' learning effectiveness (Dhawan, 2020). Many education institutions considered this to be an opportunity to rebuild conventional education practices, to cater to the present generation of learners (Pribilová & Beňo, 2024). On a positive note, students enjoyed free online access to many learning materials, better affordability of international education, and increased flexibility in learning (Barakat et al., 2023; Rieley, 2020; Mishra et al., 2020). The negative aspects of the shift to online learning were a lack of interest and engagement by students, physical strain due to the use of devices for long hours, and technical challenges like power supply interruptions, poor connectivity, and compatibility with software and systems (Adeniyi et al., 2024; Raju, 2020).

Researchers have studied students' overall well-being during e-learning and found that students' physical activity had diminished drastically during the pandemic (Coughenour et al., 2021). This led to stress, anxiety, and depression (Tilak, 2021). Many studies have also opined that more problems in terms of psychological factors such as mental disorders, hopelessness (Barakat et al., 2023; Deng et al., 2020) and suicidal thoughts were prevalent among young minds during online education (Masa'deha et al., 2022; Lemay et al., 2021). Such negative thoughts have continued to traumatize many university students compared to the pre-pandemic era (Macalli et al., 2024). This might indicate a need for education institutions to take immediate steps to support students.

Some researchers have focused on the intellectual factors involved in digital methods of education (Pei & Wu, 2019). Students shared that they are satisfied with e-learning methods and consider new ways of learning similar to the conventional methods (Allen et al., 2002). Conversely, academicians have expressed their concerns about the intellectual and cognitive skills of students during the e-learning mode (Rajhans et al., 2020). Researchers identified that low levels of engagement and limited interaction greatly affected students' motivation (Mishra et al., 2020). For some students, it was observed that retaining regular interactions with their family and friends during the pandemic helped them to consolidate their emotional well-being (Cao et al., 2020; Tartavulea et al., 2020). Furthermore, feelings of hopelessness, fatigue, and loneliness (Adeniyi et al., 2024) were overcome by many who decided to engage and concentrate more during the lectures and learning sessions (Meo et al., 2020). Yet, the majority of students could not cope well during the pandemic (Zheng et al., 2020). Generally, previous work provided clear evidence for the adverse impact of e-learning on physical, emotional, intellectual, and psychological motivations for students, which noticeably hampered the effectiveness with which they learnt (Adeniyi et al., 2024; Sadovyy et al., 2021).

Learning effectiveness during online classes was perceived by researchers to be severely affected. Students showed a tendency to take easy or simplistic approaches to managing timelines (Barakat et al., 2023), which did not help to improve students' much-needed skills. Simatupang et al. (2021) reported evidence of high levels of plagiarism during online classes since the completion of assignments had become an ordeal or obligation. This affected the performance outcomes of students since penalties were imposed for high levels of very close similarities. Hill et al. (2021) and Nasiatin et al. (2023) had witnessed growing incidents of 'ghost-writers' due to a lack of skills and motivation for students to complete assignments and coursework through their own efforts, clearly indicating ineffective learning.

Concerns regarding academic integrity became a global issue as per the report released by Education Technology, the trusted voice in Internet and Communications Technology (ICT) education, on April 1, 2021. Owusu et al. (2018) identified factors such as lack of self-esteem, lack of self-control, and lack of serious punishment for misconduct as important predictors of unethical behaviours of students who are expected to be future business leaders.

While past researchers have raised concerns regarding worsening ethics in education, they are limited in providing a clear understanding of the underlying causes and remedial measures (Masa'deha et al., 2022, Avci, 2016). It is crucial and timely to address this issue since many education institutions/private tuition centers are expecting to make blended learning a norm to make education affordable and accessible (Pribilová & Beňo, 2024) to a wider public. However, Isidori and Cacchiarelli (2017) express concerns over growing ethical breaches in virtual environments that might not have simple solutions. Lomer and Anthony-Okeke (2022) suggest changes to pedagogical structures such that student engagement is active and is reflective of ethics. Such arguments which are merely opinion based and not evidence-based form the motivation for the current study. We expand prior studies on learning effectiveness to test the impact of learning effectiveness on educational ethics. The objective of this research is therefore three-fold: (i) to determine the antecedents of online learning effectiveness; (ii) to determine whether online learning effectiveness has impacted ethics in education; and (iii) to provide a recommendation based on a comparative analysis between India and Malaysia since India had already adopted online teaching for many courses well before the pandemic. Several policy and practical implications can be drawn while preparing for the shift to the new normal, especially for institutions that continue online teaching as well as for students learning online, which are discussed towards the end of this paper.

This paper is organized as follows. In the next section, we build a literature review and theoretical background. This is followed by the formulation of the research model and the introduction of our research methods. Next, we report our findings and discussions. Finally, we conclude this paper by outlining its theoretical contributions, practical implications, and future scope of research.

THEORETICAL FOUNDATION AND HYPOTHESES DEVELOPMENT

Virtue Ethics Theory

This research predominantly uses virtue ethics theory. The theory of virtue ethics is explained as the character development of an individual to include morals and values in behavior and decision-making (Hersh, 2006). By prioritizing virtues in the learning process, teachers can ensure that learning experiences are transformative and not just transactional (Harisson & Laco, 2022). The virtue ethics theory is not new but its adoption to explain learning effectiveness is extremely scant. Mintz (1995) had explained the importance of virtue ethics theory in encouraging individuals to do the right thing through ethical thought and ethical motivation. Mintz (1995) built upon Aristotle's belief that individuals' intellectual skills such as wisdom,

understanding and good sense influence the moral actions of the individual, which can be enhanced through reflective learning. Mintz work was restricted to accounting students and hence limited to demonstrating the importance of virtues through reflective learning only for accountants. We extend this ideology to explain the importance of effective learning which can include, but not restricted to, reflective learning. This may be achieved by strengthening the physical, emotional, psychological and intellectual skills of all students in the modern era. Annas (2017) emphasizes the need to move beyond conventional discussions of virtue ethics and consider moral psychology and a holistic view of virtue ethics in the modern world.

Learning Effectiveness in the Advanced Technology Era

With progress and rapid change very evident in information and communication technology, online learning has emerged as the paradigm of contemporary education (Pribilová & Beňo, 2024). The concept of *blended learning*, to capitalize on the benefits of physical and online learning, is being introduced more rapidly by learning institutions (Dziuban et al., 2018). Online learning technologies are now integral to the future of higher education (Adeniyi et al., 2024; Henderson et al., 2017) facilitating student interactions with instructors and peers seamlessly. Successful institutions have equipped themselves with the latest technology to improve the teaching-learning experience (Barakat et al., 2023). Although Higher Educational Institutions (HEIs) were already working towards educational transformation through the adoption of advanced technology, the COVID-19 pandemic forced these into being utilized more rapidly due to the urgency of the situation. Platforms such as Zoom, Microsoft Teams, and Google Meet are widely used to video conference with students and enable discussions during class, record lectures either before or during the class, provide feedback to students and ensure gradable assignments are submitted on time (Nasiatin et al., 2023).

COVID-19 has paved the way for ample e-learning opportunities (Dhawan, 2020) including paid and free certification courses for creative solutions, active learning, and developing new skills for educators and learners (Barakat et al., 2023; Doucet et al., 2020). E-learning opportunities are known to create a positive learning environment for students (Moore et al., 2011; Smart & Cappel, 2006) leading to learning effectiveness (Bavelier et al., 2010) through increased student participation during classes and facilitating quality discussions (Panigrahi et al., 2018). However, an overnight switch to online lectures, new assessment methods, and changed communication channels for teachers and administrative support have obscured learning effectiveness (Bezerra, 2020; Khan, 2020; Khan et al. 2020). Instruction, content, motivation, relationships, and mental health are the five dominating factors that educators must consider when imparting online education (Martin, 2020).

Lack of social interaction such as the inability to meet friends and socialize, traveling bans and closed dorms (Masa'deha et al., 2022; Ma & Miller, 2020; Pan, 2020) did lead to emotional and mental imbalances for many students. Some students have managed to set aside time for sports/physical activities while many others have experienced sedentary lifestyles (Elmer et al., 2020; Di Renzo et al., 2020). Psychological distress resulted from a lack of parental guidance (Pokhrel & Chhetri, 2021) and reduced contact hours with teachers and peers (Sintema, 2020). In a post-pandemic era, the HEIs must be ready for a difficult road ahead where pedagogies will shape and direct the future of their students and their experiences. At the same time, learning effectiveness could be disrupted by psychological, physical, emotional, and intellectual attributes which is the focus of this study.

HYPOTHESIS DEVELOPMENT

Physical Attributes and Learning Effectiveness

Physical attributes are basically a person's ability to cultivate movement qualities, their body strength, speed, endurance, muscle flexibility, agility and bone joints (Islombaevich & Saotboyivich, 2021). Technological advances and high engagement with devices have resulted in delayed bedtimes, waking times, and longer sleep onset latency (Nasiatin et al., 2023; Wang et al., 2020). It has increased sedentary lifestyles, generating poor physical health since students are now tending to stay away from active leisure activities and recreational sports; instead, they spend most of their time in front of a computer screen (Pribilová & Beňo, 2024; Kooiman & Sheehan, 2014). One of the major issues faced by students in China is weight gain due to constant physical inactivity (Laar et al., 2021). Evans et al. (2012) suggested an addition of prompts to reduce seated time while working on the computer, which could reduce the emergence of serious health issues. Physical activity of students has declined when compared to the pre-lockdown scenario (Lopez-Valenciano et al., 2021), leading to stress, anxiety, and depression (Tilak, 2021).

Those students who engage in less physical activity have subsequently had to deal with more mental strains and issues, especially during the lockdown period (Rogowska et al., 2020). Such findings have been propagated to increase young students' awareness of the importance of doing exercises, which will also enhance their resilience in coping with the workload of higher education institutions (Barakat et al., 2023; Coughenour et al., 2021). Many medical problems during the juvenile years of growing up have been observed in the case of declining physical activity, for instance diabetes, obesity, and cardiovascular diseases (Dunton et al., 2020). The studies above suggest that the benefits of online learning are dwarfed by physical inactivity which would purportedly have a negative impact on learning effectiveness. However, this theme is still largely underexplored and the extant literature lacks contributions.

Existing physical education systems have been evaluated based on a person's ability to cultivate physical (movement) qualities. Strength, speed, endurance, agility, joint mobility, and muscle flexibility, which are formed at different levels in the human body, are called physical qualities. Depending on how the human body can display these qualities, an individual can be strong, agile, etc. These qualities have a dimension, the indicators of which are called indicators of physical fitness. Studies in nursing have contributed to understanding the importance of physical activeness to complete their jobs virtuously (Brody, 1988). Although very limited studies have connected physical wellbeing to virtue ethics, we can argue that physical inactivity/exhaustion can deter individuals from acting virtuously. Particularly for students since physical inactivity might impair effective learning.

H1: Physical activeness attribute is important for learning effectiveness during e-learning sessions

Psychological Attributes and Learning Effectiveness

The importance of psychological factors for positive effects on learning was emphasized by Thomas et al. (2019) and similar researchers like Aprielieva (2021). At the same time Rony & Nair, (2022) highlight importance of psychological sustainability of the students through effective learning and emphasizing virtue ethics. Positive psychology alongside virtue ethics is key to effective education (Han 2015). Virtue ethics is seen as an important theory to explain how psychological attributes can lead to effective learning. However, the intervention of COVID-19 had a serious negative effect on people's mental health (Cooper et al., 2020), especially among students in comparison to the general population. Serious psychological effects on students due to triggered anxiety, fear, and worry (Adeniyi et al., 2024; Li et al., 2020) have resulted in an unfavorable impact on learning effectiveness (Sahu, 2020). In China, 25 percent of sampled students reported anxiety issues (Masa'deha et al., 2022; Lemay et al., 2021; Cao et al., 2020) and Wang et al. (2020) reported that 53% of sampled students faced moderate to severe psychological

effects across 194 cities in China. Odriozola-Gonzalez et al. (2020) found evidence of moderate to extremely severe depression symptoms in 34.19% of students in Spain. Sundarasan et al. (2020) documented at least 30% of sampled Malaysian students were affected by minimal to most extreme anxiety levels.

Anxiety and stress for students are not new (Bruffaerts et al., 2018), and in fact online classes have only aggravated the psychological strain (Rajab et al., 2020). The unexpected shift from physical classes to e-learning led to a lack of focus and decreased motivation (Nasiatin et al., 2023; Aguilera-Hermida, 2020). Uncertainty in future professional careers leads to boredom, anxiety, and frustration (Aristovnik et al., 2020, Mahipalan & Sheena, 2019). Fear of academic year loss, inability to get timely psychological assistance from relevant faculty staff or resources and parents, and family members suffering from COVID-19 (Cao et al., 2020) were some of the other reasons for psychological distress among students. Concerns of psychological strain in students continue post-COVID-19 with students' depression and anxiety scores showing borderline abnormality (Basheti et al., 2023). Hence the concerns of learning effectiveness are likely to be more of a long-term problem to resolve. The above research led to the second hypothesis in this study:

H2: Psychological attributes are important for learning effectiveness during e-learning sessions

Intellectual Attributes and Learning Effectiveness

Intellectual attributes are a necessary aspect of human beings for cultivating their intellect and rational life. These attributes consist of clarity, precision, accuracy, depth of knowledge, logic, breadth of knowledge and relevance (Paul & Elder, 2013). Mintz (1995) has also emphasized the need for students to develop their intellectual abilities to be able to differentiate between virtues and vices. This would certainly help students to act virtuously when they are faced with ethical challenges. Cognitive elements, such as academic performance and academic experience in e-learning are comparable to those in traditional forms of education (Saville & Foster, 2021; Gossenheimer et al., 2017). E-learning has often proven beneficial in enhancing the knowledge and academic skills of students compared to conventional learning styles (Li et al., 2020). Early studies had indicated that students' satisfaction during e-learning was no different from conventional learning (Barakat et al., 2023; Allen et al., 2002), whereas later, Olivet et al. (2016) detected a higher level of satisfaction among students in the conventional method as compared to e-learning. This was despite the benefits of e-learning in enhancing intellectual skills. Digital learning tools hampered the academic performance of students (Haider & Al-Salman, 2020) and students had been reluctant to transition to e-learning methods during the COVID-19 pandemic (Blizak et al., 2020).

Educators, on the other hand, have expressed deep concerns over the low level of understanding by students, abridged interaction with students, and limited innovative teaching methods as some of the significant problems with e-learning (Adeniyi et al., 2024; Mishra et al., 2020). Educators were unable to judge the active presence, mood, and motivation of their students, disrupting their ability to gauge students' intellectual progress, intensified by other limitations such as the cancellation of laboratory activities and data collection for research projects. For the postgraduate research community, it was difficult to procure research grants for non-COVID proposals (Nicola et al., 2020). In many advanced countries like the United Kingdom and the United States, the national funding body has halted non-COVID research to free up resources for COVID-19-related topics (Tartavulea et al., 2020). Concerns were raised regarding the number of scientific conferences that had to be cancelled or postponed. Such barriers have had serious implications for the intellectual abilities of students, hampering learning effectiveness. The third hypothesis is:

H3: Intellectual attribute is important for learning effectiveness during e-learning sessions

Emotional Attributes and Learning Effectiveness

Drawing on a ‘social-constructionist and contextualized view of emotion’, Hargreaves indicated that ‘emotions are an integral part of education and of organizations more generally’ (Hargreaves, 2005, pp. 812–813). Baumchen (2018) has emphasized factors such as peace, gratefulness, positivity, ability to stay connected, determination, balanced mind, hopefulness, and mental strength as essential traits of emotional health. Kustyarini (2020) highlighted that when students can hold emotional stress and face challenges happily, it has a positive impact on student learning outcomes. While studies comparing emotional support requirements during conventional and online classes are extremely scarce, researchers have evidence that the pandemic posed a great challenge for students in managing their emotional stress or emotional challenges. The formation of virtual communities could bridge the emotional gap during e-learning (Barakat et al., 2023; Panigrahi et al., 2018; Mukhtar et al., 2020). It was also evidenced that students who had productive interactions with family, friends, and colleagues were positively motivated and demonstrated greater engagement, and better academic performance (Masa'deha et al., 2022; Liem & Martin, 2011; Mahipalan & Sheena, 2019). As such, university students who lived with parents, friends, or relatives during the e-learning period experienced positive emotions (Cao et al., 2020). Despite this, some students depicted a sense of total emotional detachment from friends, relatives, and fellow students during the lockdown period (Meo et al., 2020), which resulted in emotional exhaustion and fatigue. From a trainer's perspective, identifying the emotions of students during online learning is perceived as important for learning effectiveness. AlZu'bi et al. (2023) propose utilizing image classification techniques to detect the emotions of students and provide timely support, thereby making learning much more effective. However, this technique is a mere proposal and is at the early stages of testing. From a virtue ethics perspective, the need for increased emotional development for both educators and learners is emphasized since emotions are an integral part of teaching and learning process (Schultz & Perkrum, 2007). Thus, students who are taught to manage their emotions or develop their emotional intelligence may be inclined to act virtuously (Culham & Bai, 2011). The above studies do suggest a need for emotional support for online learning to make learning effective and to develop students' virtuous behavior. Very few researchers have studied this aspect, and this study hypothesizes the following:

H4: Emotional attribute is important for learning effectiveness during e-learning sessions

Learning Effectiveness and Educational Ethics

To explain educational ethics, we build upon the virtue ethics theory. Researchers like Mintz (1995); Annas (2017); Harrison and Laco (2022) have emphasized the need for ethics in learning which can eventually transform students to become better and virtuous individuals in the bigger world. To aid the transformation process, especially in the digital era, higher education institutions have put in place online learning policies for students that address privacy, plagiarism, and copyright concerns (Masa'deha et al., 2022; Khan, 2020; Dendir & Maxwell, 2020). Arguably such processes must help to restrict academic misconduct by students. Overarching the virtue ethics theory is the critical importance to investigate ethics in education and make it a “long-term educational reality” (Levinson, 2020). Ethics is therefore a prerequisite to ensure academic credibility (Berkey & Halfond, 2015). Although students are aware of general ethical guidelines, confusion exists among the students concerning ethical practices during e-learning sessions (Nasiatin et al., 2023) and concerns of increasing incidences of ethical breaches in education are recorded (Isidori and Cacchiarelli (2017)

Researchers have examined students' viewpoints on temptations and the propensity toward unethical behavior which leads to actual behavior in their future work life. Scholars found that students' beliefs and intentions are important predictors of their actions in the future (Owusu et al., 2018). Chawdhry et al. (2017) suggests that providing students with rich material beyond generic and basic information could encourage them to look out for newer resources during

assessments. Wen (2023) proposed strategies such as clarifying evaluation objectives and standards, introducing diverse evaluation methods, strengthening teacher training and support, establishing a mechanism for student participation and feedback, as well as promoting the integration of traditional virtues education with disciplines to help improve ethics in education. Very few studies have been done in this area particularly during the onset of the coronavirus pandemic. The advent of ChatGPT has only exacerbated the issue of learning effectiveness and educational ethics. In answering whether learning effectiveness leads to ethics in education, there seems to be very little discussion on this matter. A better argument supporting this hypothesis was provided by Harrison (2020) who claimed that students who felt well connected, engaged, and supported will be less inclined to cheat. This provides support to an earlier finding by Hess et al. (2016). They claimed that a well-designed online course, with sufficient scaffolding and reflectivity, will guide students' ethical behavior positively. With the above arguments and limited research in this area, the next hypothesis is:

H5: Learning Effectiveness is important for ethics in education during e-learning sessions

India and Malaysia

This article examines the impact of the COVID-19 pandemic on the higher education sector in India and Malaysia in the context of challenges posed by the lockdown and sudden campus closures of higher education institutions. The two countries have a close cultural exchange program including education and this practice is prominent in the South Asian and Southeast Asian regions (Pande et al., 2009). Globalization trends have led to enhanced bilateral and regional links and economic integration of the two emerging market economies (Roche, 2017). India and Malaysia were chosen for the study because of their cultural, social, and historical connections since the two countries have a shared vision of growth through partnership, technological developments, and cultural and educational exchange. Online learning has long emerged as a new dimension in higher education in India (Berkey & Halfond, 2015), both within as well as beyond the classroom with intentions of furthering the use of technology in education (Jaiswal, 2013).

In the past few years, India has produced many world-class universities and colleges offering online courses which have rapidly become popular among students (Dhawan, 2020) whereas Malaysia's HEIs have more recently started their initiatives in applying the e-learning approaches, denoting a shift towards an emphasis on using technology (Al-Rahmi, 2015). The students in Malaysia had experienced a relatively seamless transition to online learning during the pandemic and this made it more enjoyable and bearable to learn online (Adeniyi et al., 2024). Online exams in India were monitored through AI-initiated e-proctoring systems (Raman et al., 2021) but there was no clarity on how Malaysia adopted the monitoring of online exams (Hassan et al., 2020). It would therefore be interesting to examine the difference in the outcome between Malaysia and India. For this, we consider the hypothesis in its null form:

H6a: There is no difference in learning effectiveness between students of HEI in Malaysia and India

H6b: There is no difference in ethics in education between students of HEI in Malaysia and India

Based on the discussions above, the following conceptual framework is proposed (Figure 1).

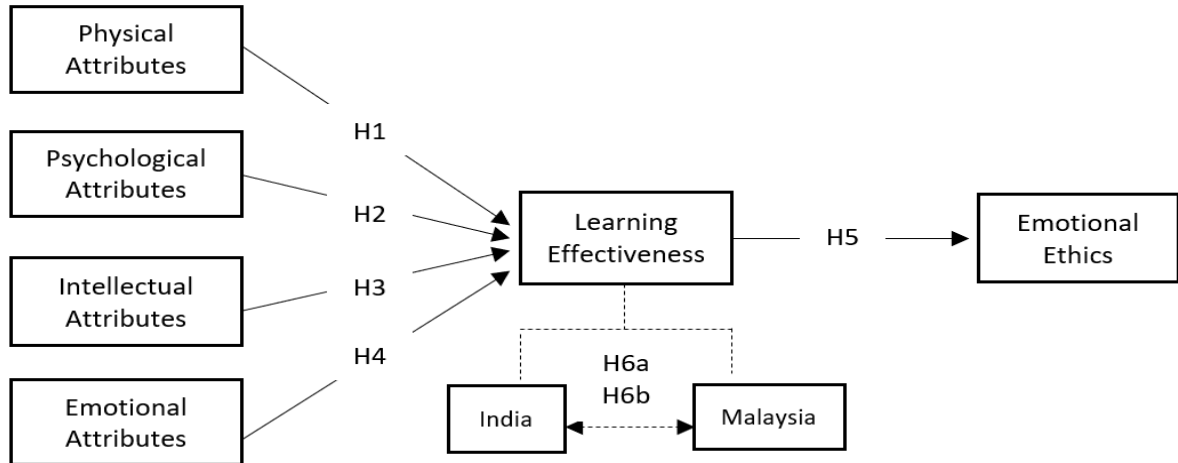


Figure 1: Proposed conceptual model.

METHODS

Instrument Detail

Data was collected through a self-distributed 5-point Likert scale questionnaire ranging from 1 (“Strongly Disagree”) to 5 (“Strongly Agree”). All measurement items were adopted and confirmed by previous research.

A 5-item scale of physical attributes was adapted from Laar et al. (2020). Physical attributes are basically a person's ability to cultivate movement qualities, their body strength, speed, endurance, muscle flexibility, agility and bone joints (Islombaevich & Saotboyivich, 2021). A sample item includes, “I was able to move around the house during classes within the restricted area to flex my body”. Laar et. al. (2020) reported composite reliability of 0.82. A five (5) item of psychological attributes was adapted from Zhang et al. (2021). Psychological attributes are very complex in nature and defined in terms of intelligence, aptitude, interest, personality and values dimensions (Fried, 2017). A sample item is such as “I always felt satisfied with the way classes were conducted in online mode”. Zhang et. al (2021) reporting a composite reliability of 0.89. A six (6) item of intellectual attributes was adapted from Saville & Foster (2021). Intellectual attributes are a necessary aspect of human beings for cultivating their intellect and rational life. These attributes consist of clarity, precision, accuracy, depth of knowledge, logic, breadth of knowledge and relevance (Paul & Elder, 2013) A sample item includes, “I have managed to gain more knowledge through Internet of Things (IOT)”. Saville & Foster (2021) reported composite reliability of 0.87.

An eight (8) item scale of emotional attributes was adapted from Sundarasan et al. (2020). Baumchen (2018) has emphasized factors such as peace, gratefulness, positivity, ability to stay connected, determination, balanced mind, hopefulness, and mental strength as essential traits of emotional health. A sample item includes, “I had more time to attend family get-togethers” and “invariably feel excited during online learning”. Sundaresan et. al. 2020 reported composite reliability of 0.94.

Additionally, a six (6) item scale of learning effectiveness was adapted from Khan et al. (2020). Learning effectiveness is not defined clearly and has mixed connotations. In the context of online learning, it refers to approaches used online to facilitate effective and efficient teaching and learning practices (Dhawan, 2020). A sample item is such as “I was able to learn faster during online classes” or “Availability of support clinics from the department helped me learn more effectively”. Khan et. al. (2020) recorded composite reliability of 0.92. Finally, 5 items of ethics in

education were adapted from Uzun & Kilis (2020). Like learning effectiveness, education ethics is not defined but is often referred to as the morals, virtues and values upheld by students in their actions (Owusu et al., 2018). A sample item includes, “I was more inclined towards checking my answers with friends in online exams”. The composite reliability index recorded by Uzun & Kilis (2020) was 0.85. The full list of measurement items is presented in Appendix 1.

Context

It was decided that the questionnaire would be executed in Malaysia and in India simultaneously. Prior to the execution of the final questionnaire, it was necessary to run it through educational experts who read and endorsed the questionnaire and helped to reconstruct some of the sentences. It was decided that the questionnaire would be open for 3 months and frequent reminders would be sent to students while monitoring the responses. The researchers also had a responsibility to assure the participants about confidentiality.

Sampling Technique

The respondents for this study were undergraduate students (years 1 to 4) studying in different universities either in Malaysia or India, since one of the objectives of this study is to draw conclusions from comparative study between Malaysia and India. This study employed a convenience sampling technique, selecting participants based on their accessibility and proximity. Convenience sampling method is particularly advantageous for cross-country research like the current study, which compares Malaysia and India. Given the practical challenges of reaching a wide population across two distinct countries, convenience sampling provided a feasible solution to gather sufficient data for initial insights (Etikan et al., 2016). Convenience sampling is invariably useful in education and social sciences where researchers have ready access to existing target populations (Golzar et al., 2022). The first round of questionnaire distribution for this study was students of researchers due to the ease of accessibility to these respondents and speed of responses. Following insufficient responses, other lecturers were approached for assistance in disseminating the questionnaire.

Data Collection

This study employed online data collection due to its cost-effectiveness, wide reach, speed, convenience, accuracy, and flexibility (Fricker & Schonlau, 2002). The questionnaire was prepared using the *QuestionPro* survey software, which is known for its ease of use amongst students (Elbeck, 2014). This method proved to be highly efficient in comparing the differences in the learning effectiveness between the two countries (Wright, 2005). The researchers approached their potential respondents by seeking the willingness of participant students to undertake the survey (Golzar et. al. 2022). Further, the questionnaire distribution was extended to other universities by contacting lecturers who agreed to help with the data collection from their respective students. The *QuestionPro* system was open for three months and a rigorous monitoring of the data was executed. Data that was incomplete was immediately removed to facilitate the researcher to achieve sufficiency of usable data.

Sample Size

A total of 1094 emails containing the questionnaire links were sent, of which 594 were fully completed and returned. The response rate for the study is approximately 54%, which is generally acceptable in social science research (Baruch & Holtom, 2008). After cleaning the data to remove outliers, such as missing data and straight liners, 571 questionnaires were accepted for analysis. Based on the G*Power analysis, a study of this nature necessitated a minimum sample size of 138 (Faul et al., 2007). According to Hair et al. (2010), a sample size surpassing 200 holds significance in identifying substantial relationships during analysis.

Common Method Bias

Kock et al. (2020) explained the importance of addressing common method bias through “*profound questionnaire design*”. The researchers ensured that the respondents were assured of anonymity, confidentiality of information and explained that there was no right or wrong answer. The 5-point Likert scale allowed respondents to make a free choice of responses. The statements were kept short and very straightforward. The questionnaire avoided any question that would trigger student anxiety levels. The questions for dependent and independent variables were taken from different sources. To this extent the risk of common method bias was addressed during the questionnaire preparation stage. In addition, the common method bias was assessed using Harman’s Single Factor method (Podsakoff et al., 2003; Podsakoff & Organ, 1986). All measurement items were subjected to factor analysis, and the results indicated that the first factor accounted for 25.60% of the total variance (see Appendix 2). Since no single factor explained more than 50% of the variance, this suggests that common method bias is not a significant issue in this data set (Podsakoff & Organ, 1986).

Respondents’ Profile

Table 1 below summarizes the demographic composition of respondents who took part in this study. The table indicates a relatively balanced gender distribution among respondents, with a slight majority being male (53.8%). The distribution across different years of study shows that first-year and final-year students have the highest representation (29.6%). The majority of respondents are from private universities (66.5%). Additionally, a larger proportion of respondents are studying in India (54.8%) compared to Malaysia (45.2%).

Table 1: Respondents’ demographic profile ($N=571$)

Demographic Details	Percentage of Respondents
<i>Gender</i>	
Male	53.8%
Female	46.2%
<i>Year of Study</i>	
Year 1	29.6%
Year 2	24.3%
Year 3	16.5%
Final Year	29.6%
<i>University Type</i>	
Public/Government	33.5%
Private	66.5%
<i>Country of Study</i>	
Malaysia	45.2%
India	54.8%

DATA ANALYSIS AND RESULTS

The Statistical Package for the Social Sciences (SPSS) Version 25 was used to eliminate outliers and analyze descriptive results while the Partial Least Squares Structural Equation Modelling (PLS-SEM), using SmartPLS 3.2.3 (Ringle et al., 2015), was employed for hypothesis testing. Finally, an independent sample *t-test* analysis using SPSS helped to determine the differences in learning effectiveness and ethics in education between students in Malaysia and India. A total of 571 usable samples across Malaysia and India were tested using PLS SEM and a *t-test* was employed to test the difference between Malaysia and India.

Assessment of Measurement Model

Table 2 exhibits the construct reliability and convergent validity of the constructs in this study. The outer loadings' indicator for most items has surpassed the recommended value of 0.708 (Hair et al., 2014). PHA1, PHA2, IA3, EA1, LE4, and EE5 were removed from the model because they did not attain satisfactory reliability. Nevertheless, some indicators that have a value below 0.708, such as PHA3 (0.613), PHA5 (0.670), and PSA1 (0.646) were retained since the average variance extracted (AVE) outcome of 0.5 was achieved (Ramayah et al., 2018). Moreover, the composite reliability (CR) values for all dimensions indicate that these constructs have internal consistency, given that the CR values were above the threshold of 0.7 (Hair et al., 2010). In addition, Table 2 reports that the construct of this study has also attained the minimum threshold value of 0.5 for AVE, strongly suggesting that the items loaded in the equivalent constructs constitute more than 50% of the variance of the constructs (Hair et al., 2014).

Table 3 presents the discriminant validity estimation where the object is to examine the degree to which the construct is exclusive and discrete from all others and does not assess the occurrence explained by other constructs in the framework (Hair et al., 2017). The Heterotrait-Monotrait (HTMT) ratio (Hensler et al., 2015) was employed to: firstly, reveal the presence of multicollinearity; and secondly, to ascertain discriminant validity. Table 3 shows that all constructs are significantly distinct at HTMT0.90 (Gold et al., 2001) and HTMT.85 (Kline, 2011). Thus, discriminant validity has been proven.

Assessment of Structural Model

Preceding the structural model assessment, it is vital to make certain that the inner model of the study has no lateral collinearity issue. Thus, the collinearity assessment shows the Variance Inflation Factor (VIF) values for different attributes in relation to learning effectiveness and educational ethics. For learning effectiveness, the VIF values are as follows: emotional attributes (2.435), intellectual attributes (2.552), physical attributes (1.390), and psychological attributes (2.643). The VIF value for educational ethics is 1.000. All the constructs' inner VIF values are lower than the threshold value of 3.3 (Diamantopoulous & Siguaw, 2006), ensuring that the lateral multicollinearity problem is eliminated.

Figure 2 represents the structural model of this study. Five direct hypotheses were presented and tested for this study. Path coefficients were evaluated using the bootstrapping techniques to determine the significance levels of the hypothetical relationships. Table 4 indicates that physical attributes ($\beta = 0.056, p < 0.05$), psychological attributes ($\beta = 0.275, p < 0.01$), intellectual attributes ($\beta = 0.325, p < 0.01$), and emotional attributes ($\beta = 0.268, p < 0.01$) have a significant positive relationship with learning effectiveness. Hence, H_1 , H_2 , H_3 and H_4 are supported. Similarly, learning effectiveness ($\beta = 0.330, p < 0.01$) is positively related to educational ethics. Therefore, H_5 is supported. Meanwhile, examining the relative importance of the exogenous constructs in predicting the dependent construct (LE), it is evident that Intellectual Attributes (IA = 0.325) are the most significant predictors, followed by Psychological Attributes (PSA = 0.275), Emotional Attributes (EA = 0.268), and Physical Attributes (PHA = 0.056). Additionally, when analyzing the endogenous construct of educational ethics, learning effectiveness yields a slightly stronger impact on Educational Ethics (EE = 0.330).

Furthermore, an assessment of determination coefficients (R^2) and effect sizes (f^2) was conducted to understand the strength, relevance, and impact of the model's variables and their relationships. This ensures that the results are both statistically significant and practically meaningful. The R^2 value of learning effectiveness (LE) is 0.654. Indicated here is that physical attributes, psychological attributes, intellectual attributes, and emotional attributes account for 65% of the variance in learning effectiveness (LE). Additionally, the R^2 value of ethics in education (EE) is

0.120, which implies that learning effectiveness (LE) accounts for 12% of ethics in education (EE) variances.

Table 2: Reflective Measurement Model: Factor Loadings, CR, and AVE)

Construct	Loadings	CR	AVE
<i>Physical Attributes (PHA)</i>		0.771	0.536
PHA3	0.613		
PHA4	0.884		
PHA5	0.670		
<i>Psychological Attributes (PSA)</i>		0.899	0.642
PSA1	0.646		
PSA2	0.795		
PSA3	0.816		
PSA4	0.882		
PSA5	0.845		
<i>Intellectual Attributes (IA)</i>		0.870	0.574
IA1	0.779		
IA2	0.746		
IA4	0.728		
IA5	0.792		
IA6	0.741		
<i>Emotional Attributes (EA)</i>		0.891	0.544
EA2	0.538		
EA3	0.754		
EA4	0.783		
EA5	0.824		
EA6	0.861		
EA7	0.692		
EA8	0.663		
<i>Learning Effectiveness (LE)</i>		0.878	0.592
LE1	0.842		
LE2	0.813		
LE3	0.680		
LE5	0.705		
LE6	0.795		
<i>Educational Ethics (EE)</i>		0.812	0.526
EE1	0.678		
EE2	0.839		
EE3	0.794		
EE4	0.555		

Note: PHA1, PHA2, IA3, EA1, LE4 and EE5 was deleted due to low loadings; AVE= Average Variance Extracted and CR= Composite Reliability

Finally, the guideline by Cohen (1988) served to gauge the extent of effect sizes, which are trivial (< 0.02), small (0.02), medium (0.15), and large (0.35). The effect sizes of the exogenous variables on the endogenous variable, where the intellectual attributes ($f^2 = 0.120$) have a medium effect size, psychological attributes ($f^2 = 0.083$) have a small effect size, emotional attributes ($f^2 = 0.086$) have a small effect size, and physical attributes ($f^2 = 0.010$) has a trivial effect size on LE. LE ($f^2 = 0.122$), on the other hand, has a medium effect size on EE. These verdicts reveal that intellectual attributes are more crucial in explaining LE compared to physical, psychological, and emotional attributes. Notably, LE is an important predictor of EE.

Table 3: Discriminant validity: Heterotrait-Monotrait (HTMT) criterion (2015)

	EE	EA	IA	LE	PHA	PSA
EE						
EA	0.324					
IA	0.241	0.860				
LE	0.403	0.832	0.887			
PHA	0.332	0.605	0.541	0.606		
PSA	0.271	0.793	0.847	0.838	0.749	

Note: HTMT < 0.85 (Kline, 2011), HTMT < 0.90 (Gold et al., 2001)

Table 4: Path Co-efficient Assessment

Paths	Beta	Std. Error	<i>t</i>	ρ	LLCI	ULCI	Result
H1 PHA→LE	0.056	0.031	1.803*	0.036	0.005	0.105	Supported
H2 PSA →LE	0.275	0.044	6.208**	0.000	0.206	0.351	Supported
H3 IA →LE	0.325	0.047	6.948**	0.000	0.248	0.402	Supported
H4 EA → LE	0.268	0.046	5.779**	0.000	0.193	0.343	Supported
H5 LE→EE	0.330	0.049	6.697**	0.000	0.244	0.407	Supported

Note: ** $p < 0.01$, * $p < 0.05$ (one-tailed)

EE = Educational Ethics; EA = Emotional Attributes; IA = Intellectual Attributes; LE = Learning Effectiveness; PHA = Physical Attributes; PSA = Psychological Attributes

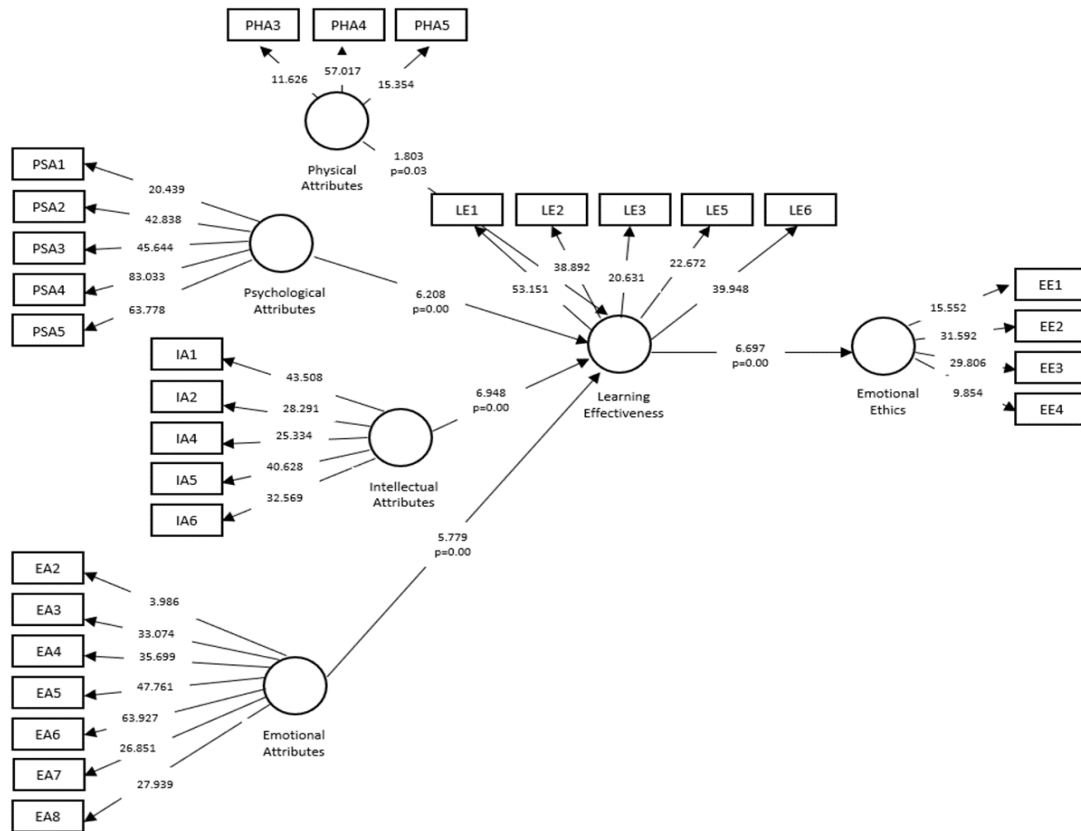


Figure 2: Structural Model

Independent T-Test Assessment

To examine the difference in learning effectiveness and educational ethics between students in Malaysia and India, an Independent T-Test was conducted. H_{6a} and H_{6b} examined whether the country of study had an influence on students' learning effectiveness and educational ethics. For learning effectiveness, the Levene's Test for equality of variances indicated a significant result ($f = 9.586$, $p = 0.002$), which is below the cut-off of 0.05. Consequently, the assumption of equal variances has been violated, and the t-value should be obtained from the equal variances not assumed. The significant level for equal variances not assumed t -Test was $t = 0.139$, $df = 568.85$, $p = 0.889$ ($p > 0.05$), indicating that there were no significant differences in e-learning effectiveness between students studying in Malaysia and India. Based on this finding, H_{6a} is supported, and it implies similarity in learning effectiveness between Malaysian and Indian students during e-learning.

Next, regarding educational ethics, the Levene's Test for equality of variances indicated a non-significant result ($f = 0.274$, $p = 0.601$), thus the t-value was obtained from the equal variance assumed. The t-test results, assuming equal variances, indicated a significant difference in educational ethics between Malaysian and Indian students: $t = -2.320$, $df = 569$, $p = 0.021$ ($p < 0.01$). Specifically, the mean educational ethics score for Malaysian students was 3.127 with a standard deviation of 0.476, while Indian students had a mean score of 3.220 with a standard deviation of 0.481. This suggests that students in India (Mean = 3.220) practice comparatively higher educational ethics than those in Malaysia (Mean = 3.127). Consequently, H_{6b} was rejected, denoting that there were mean differences in educational ethics between students in Malaysia and India. Overall, the results showed no significant difference in learning effectiveness between students from Malaysia and India. However, there was a significant difference in educational ethics, with Indian students scoring higher than Malaysian students.

DISCUSSION AND IMPLICATIONS

Some interesting results emerged from this study. First, we hypothesized that physical activeness attribute is important for learning effectiveness during e-learning sessions. Based on the outcome of this study, physical attributes are observed to be important for learning effectiveness, although their impact was trivial. As such our first hypothesis is accepted. The studies partially concur with those of Nasiatin et al. (2023), Coughenour et al. (2021), Laar (2020) who have also emphasized the importance of physical activeness of students on their learning effectiveness. These researchers have found many medical problems if there is lack of physical movement from the students during online classes. Our results might not be surprising since research shows that many health awareness-free online videos have helped many individuals to keep active and healthy (Nasiatin et al., 2023), and many have even managed to lose weight during the pandemic (Barakat et al., 2023).

Next, we hypothesized that psychological attributes are important for learning effectiveness during e-learning sessions. Our results support this hypothesis with a small effect suggesting that some amount of anxiety and stress is inevitable during online learning. The results concur with those of Adeniyi et al. (2024), Lemay et al. (2021), and Cao et al. (2020) who have evidenced the importance of student psychological support when they show symptoms such as anxiety, fear, depression, psychological strain, frustration etc. (Rajab, 2020). Education institutions throughout the world have intensified online counselling and support for student well-being, and some universities have provided motivational talks as a part of their teaching responsibilities. These would undoubtedly help students manage themselves during trauma.

Thirdly we hypothesized that intellectual attributes are important for learning effectiveness during e-learning sessions. We support this hypothesis suggesting that online classes must be

intellectually stimulating to make learning effective. This research revealed that out of all the factors tested, intellectual attributes are the highest predictor of learning effectiveness. These findings very closely agree with the work done by Pribilová and Beňo (2024) and Pei and Wu (2019) who evidence the tangible benefits of using new softwares and information technologies in pedagogy to stimulate the intellectual quotient of the learners. Educators would have upskilled themselves to potentialize technology to make classes interesting and enhance learning during online classes.

Fourthly we hypothesized that emotional attributes are important for learning effectiveness during e-learning sessions. Our findings support this hypothesis, *albeit*, with minimum contribution towards the outcome indicating that emotional support does impact learning effectiveness. This concurs with the studies by Barakat et al. (2023), Panigrahi et al. (2018), and Mukhtar et al. (2020), Cao et al. (2020) who emphasized the need for learners to have emotional support for positive outcomes. Spending sufficient time on recreational activities with family members and developing positive relationships with family and friends would have helped many students overcome their emotions and loneliness during online classes.

Next, we hypothesized that learning effectiveness is important for ethics in education during e-learning sessions. Our findings support this hypothesis through a positive relationship suggesting the importance of enhancing learning effectiveness to maintain ethics in education. This is consistent with Hess et al. (2016), Masa'deha et al., (2022); Chawdhry et al., (2017). With sufficient scaffolding and reflectivity, educational institutions can likely influence students' ethical behavior positively. Owusu et al. (2018) opine that education ethics should be an integral part of the training of students worldwide as it will shape their future actions as business representatives and can avoid the occurrence of scandals and scams.

Finally, we compare our findings between India and Malaysia. We provided the hypothesis in both null and alternative forms. Our results do not reveal the difference in learning effectiveness (LE) between the two countries. However, we evidence that ethics in education was better among students in India in comparison to Malaysia. The timely use of Artificial Intelligence in developing e-proctoring emerged as a boon for India (Raman et al., 2021) while Malaysia was still way behind in implementing virtual classes (Barakat et al., 2023). Learning effectiveness results are positive in Malaysia which is very encouraging. It leads to the conclusion that the transition from an old pedagogy to modern learning methods was smoother and well-adapted in the universities and colleges in the last few years. There was no such direct comparative study in the past and to the best of our knowledge this is the first such study in learning effectiveness and education ethics.

Theoretical Implications

Over and above the practical contributions, this research also contributes to the virtue ethics theory. The value of education for appropriate career formation is well embraced. However, the growing interest in ethical issues in the corporate world as well as in education has led to the need for higher education institutions to build a sense of virtue in students for their character and moral development. With education institutions moving to blended learning approaches, instilling virtues in students is of utmost importance. We believe that through effective learning approaches it is possible for ethical challenges faced by higher learning institutions to be addressed. We thus contribute to and supplement past studies that have emphasized the importance of value and virtue ethics in education.

Practical Implications

The main objective of this study was to explore and test the antecedents of e-learning on learning effectiveness and consequently on ethics in education comparing India and Malaysia. All the attributes used in this study tested positive and significant in predicting learning effectiveness

with a significantly positive impact on ethics in education during e-learning. Physical attributes were trivial in predicting learning effectiveness while psychological and emotional attributes had a small impact and intellectual attributes played a bigger role, *albeit* a medium or moderate effect, on learning effectiveness. Students in India demonstrated better commitment to ethics than Malaysian students. We believe that our findings regarding various attributes of online learning effectiveness add to the profound literature and help to understand antecedents contributing to successful learning effectiveness which leads to positive ethics in education in both countries.

Several practical contributions have surfaced for both countries. Firstly, HEIs that are continuing online classes must endeavor to stimulate students intellectually. This may be done through educational games, quizzes, surveys, and polls as may be relevant to the subject, most of which are gaining prominence. Gaming strategies should be maximized with students to teach the subjects in practical ways. Emerging technologies such as Artificial Intelligence (AI), machine learning, virtual reality (VR), augmented reality (AR), quantum computing, robotics, Internet of Things (IoT), and blockchain are potent tools for making teaching and learning engaging and interesting. Teachers' training is vital and must be considered by HEIs to help create intellectually stimulating virtual classrooms that can help educators create better lesson plans, help in accurate grading, and provide feedback. VR and AR will be superb tools for making lectures interactive and ensuring the motivation levels of students are kept high. IoT will help to integrate various smart devices such as digital boards, software, and hardware to enhance the effectiveness of learning. Furthermore, industry-HEI collaborations must be encouraged and strengthened so that HEIs are successful in bringing expertise to virtual classrooms. These steps can help stimulate students' intellectual capabilities and guide them through the ethical use of technology while also exploiting technology to bring about personal benefit.

Secondly, HEIs must support the students psychologically and emotionally. For example, increased duration of mentoring to provide emotional support and guidance can inspire struggling students to learn more effectively. Casual discussions before, during, or after class to de-stress students from the core learning activity are pivotal for a positive teacher-learner relationship and mitigate the negative effects of anxiety and stress. It is advisable to have designated counselling and mental well-being experts for students who are struggling psychologically during the pandemic's trying times. Infrastructural arrangements for students with learning difficulties or students with specific accessibility requirements must be made available. It is therefore crucial to address such factors seriously and efficiently, as these steps are more likely to retain the motivation of students and lead to higher satisfaction levels in student feedback.

Thirdly, students must be encouraged and must take it upon themselves to keep physically active during online classes. This may be forgotten especially when students are struggling to meet deadlines. Regular reminders for physical activities can be promoted by educators to remind students to be mobile, stay away from excessive screen time and enjoy minimum sleep hours to keep them as physically and mentally alert as possible. There can be many creative and interesting ways like college/university level virtual fitness challenges or student club competitions to encourage students to stay mobile and physically flexible. Emerging technologies such as VR and AR will be quite useful in enhancing the physical activity of the students.

Fourthly and finally, educational institutions must take ample steps to ensure that ethics in education are not affected because of the 'new normal', failing which could prove detrimental in the long-term for students and institutions. While technology can be utilized further to conduct proctored examinations, the use of web cameras during exams and special browsers are also some options to be considered. This will help to curb unethical practices during online examinations and mitigate academic dishonesty. Notwithstanding, students must be mentally deterred from academic misconduct through student training on ethical practices during assessment periods. A change of behavior and/or culture must be the focus point of HEIs.

Limitation and future recommendations

As our study is a comparative cross-sectional survey, possibilities of causal inferences cannot be ruled out. The limited sample size from both countries might make it difficult to generalize the study. Moreover, in-depth qualitative analysis methods and other stakeholder perspectives would have strengthened research findings. Future research should attempt to understand other stakeholders such as educators who have their viewpoints and HEIs' management teams, who are in positions to influence learning effectiveness and consequently the role of ethics in education. However, this study can be expanded by exploring the role of government and national education policies for HEIs in maintaining infrastructure, technology standards, and new methods of teaching and pedagogy with reference to e-learning. Finally, researchers have an opportunity to use qualitative methods for a more in-depth analysis of students' perceptions and feelings toward online learning.

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APPENDIX

Measurement Items

Construct	Measurement Items
Physical Attributes	PHA3: I feel that I looked better during the lockdown than during the pre-lockdown times (Improved Health). PHA4: I feel healthy and physically fit since I avoided travelling. PHA5: I was able to move around the house during classes within the restricted area to flex my body.
Psychological Attributes	PSA1: I was able to get good mentoring from the faculty members during the lockdown period. PSA2: I always felt satisfied with the way classes were conducted in online mode. PSA3: I was able to interact and engage better in conversations and discussions during the online classes. PSA4: I was always motivated to join online classes as compared to attending face-to-face classes. PSA5: I was always well prepared for the online class sessions as compared to face-to-face classes.
Intellectual Attributes	IA1: I had sufficient consultation hours with my lecturers during online classes. IA2: I had experienced novel ways of enhancing knowledge in e-learning. IA4: I had good training and support from the university in technology usage and specifically the online mode of learning. IA5: I had good experience in preparing creative and purposeful assignments during this time. IA6: I have managed to gain more knowledge through Internet of Things (IOT).
Emotional Attributes	EA2: I had more time to attend family get-togethers. EA3: I had more fun with my peers and teachers during online classes. EA4: I feel closer to my teachers now in comparison to physical classes. EA5: I always wake up in the morning feeling refreshed. EA6: I invariably feel excited during online learning. EA7: I felt that I was treated with special care and love during my exams and online classes. EA8: I had sufficient time to spend on recreational activities when compared to pre-lockdown.
Learning Effectiveness	LE1: I was able to learn faster during online classes. LE2: Recording of ongoing lectures, tutorial classes helped in enhancing knowledge that made learning a pleasurable experience. LE3: I was satisfied with adequate resources that were available online for effective and productive learning. LE5: I have scored higher marks in most subjects as a result of online learning as compared to conventional learning. LE6: Availability of support clinics from the department helped me learn more effectively.
Educational Ethics	EE1: I was more inclined towards checking my answers with friends in online exams. EE2: I showed a tendency to keep books next to me during online exams. EE3: I referred to study materials during the exams in spite of exams being closed-book. EE4: I was very casual during online exams when compared to physical exams.